蝶と蛾 *Tyô to Ga,* **42** (3) : 195 − 205, 1991

Two New Species of the Genus *Operophtera* (Lepidoptera, Geometridae) from Japan

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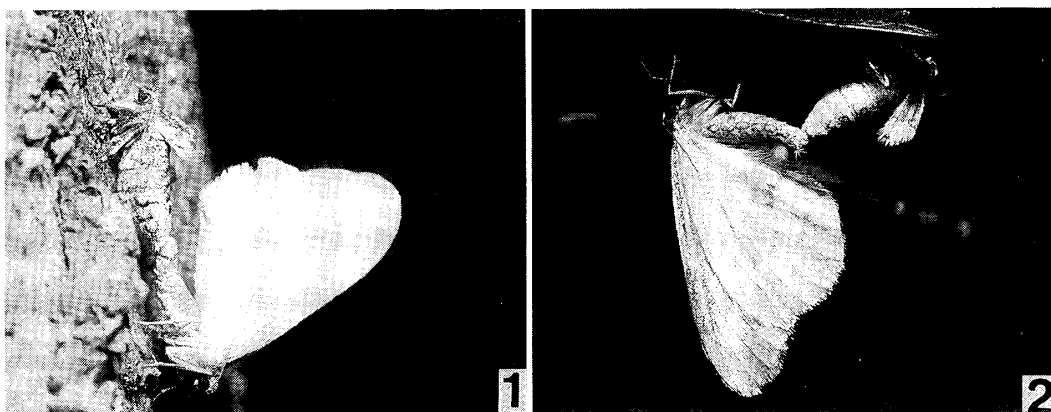
Abstract Two new species of the genus *Operophtera* are described from Japan.

Key words Geometridae, *Operophtera brunnea, O. vulgaris*, description, Japan.

Operophtera HÜBNER, [1825], is distributed in the Holarctic Region, and ten species have hitherto been known. *Operophtera brumata* (LINNAEUS, 1758) was considered to be distributed from Europe, Amur-Ussuri District to Japan and in North America, while *Operophtera fagata* (SCHARFENBERG, 1805), the closest relative of *brumata*, ranges in Europe and Amur-Ussuri District, not distributed in Japan. The latter species is distinguishable from the former in the following points: male wings larger, paler and more glossy and female has larger wings.

In the course of my study on winter geometrid moths (NAKAJIMA, 1986), I collected and examined numerous specimens of this complex, and became aware of the presence of two forms in the female wings, *i. e.*, small and large winged ones. I compared them with European *brumata* and *fagata* intensively with regard to the possibility of occurrence of *fagata* in Japan. As is often the case with winter geometrids, the differences of genitalic characters seem to be quite delicate, but, at least, Japanese specimens are not conspecific with *brumata* and *fagata*, and can also be divided into two groups. For clarifying the specific differences in these sexually dimorphic moths, I first took only the copulating pairs (about 80 pairs) for comparison, and drew a conclusion that they are the mixture of two good species to be described as new.

In writing this paper, I am much indebted to Dr. Hiroshi INOUE of Otsuma Women's University, Iruma, and Dr. Mamoru OWADA of the National Science Museum, Tokyo, for their kindness in giving me invaluable advice. My thanks are also due to Messrs. Kazuyoshi JINBO, Katsumi YAZAKI and Hideki KOBAYASHI for supplying the material, together with valuable information. The specimens of Denmark have been offered by Dr. Peder SKOU to whom I am most grateful for his kindness. And I express my hearty thanks to Messrs. Hiroshi ENDO, Kiichiro FUJIWARA, Kazuo IIJIMA, Niima IIZUKA, Toshiyuki IKENOUE, Tatsuo INOKO, Shiro IWASAKI, Mitsuru KAMEDA, Hatsushi KASAI, Shigeru KIMATA, Koetsu KUDO, Yuichi KUSUNOKI, Shingo MUNESUE, Yoshio SAITO, Akio SASAKI, Ichiro TATEYAMA, Ryuhei TOKUNAGA, Masaaki TOMONAGA, Yasuyuki WATANABE and Yoshihiro YANAGIDA for the gifts of specimens.

The holotypes and some paratypes of the new species described herein will be

Figs. 1 – 2. Copulating pairs. 1. *Operophtera brunnea* sp. n. 2. *O. vulgaris* sp. n.

preserved in the National Science Museum, Tokyo (NSMT).

Operophtera brunnea sp. n.
(Figs. 1, 3, 7)

Operophtera brumata (part.): INOUE, 1959: 194, pl. 137, fig. 15b (♀), nec LINNAEUS, 1758.

Male (Fig. 7). Each segment of antenna short in distal half. Forewing length 14 – 17 mm. Very similar to *O. brumata*, but rather larger in size. Both wings grayish brown or brown, forewing with medial, postmedial and subterminal lines irregularly waved, space between postmedial and subterminal lines dark brown. Ground color of wings variable, not so tinged with reddish brown as in *brumata*.

Female (Fig. 3). Forewing length 1 – 3 mm. Body dark brown. Wings very small, a slender transverse black line traceable in most specimens.

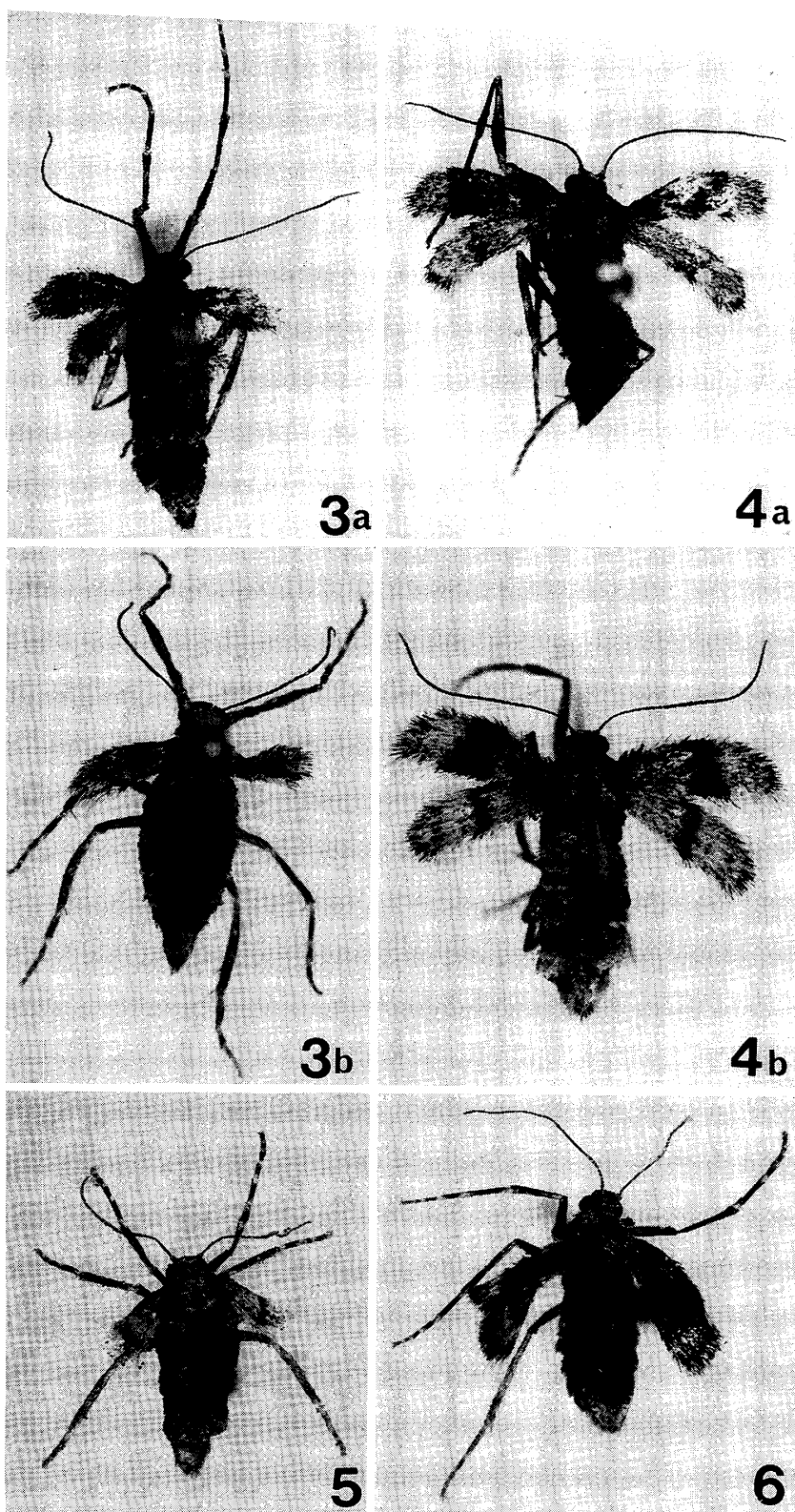
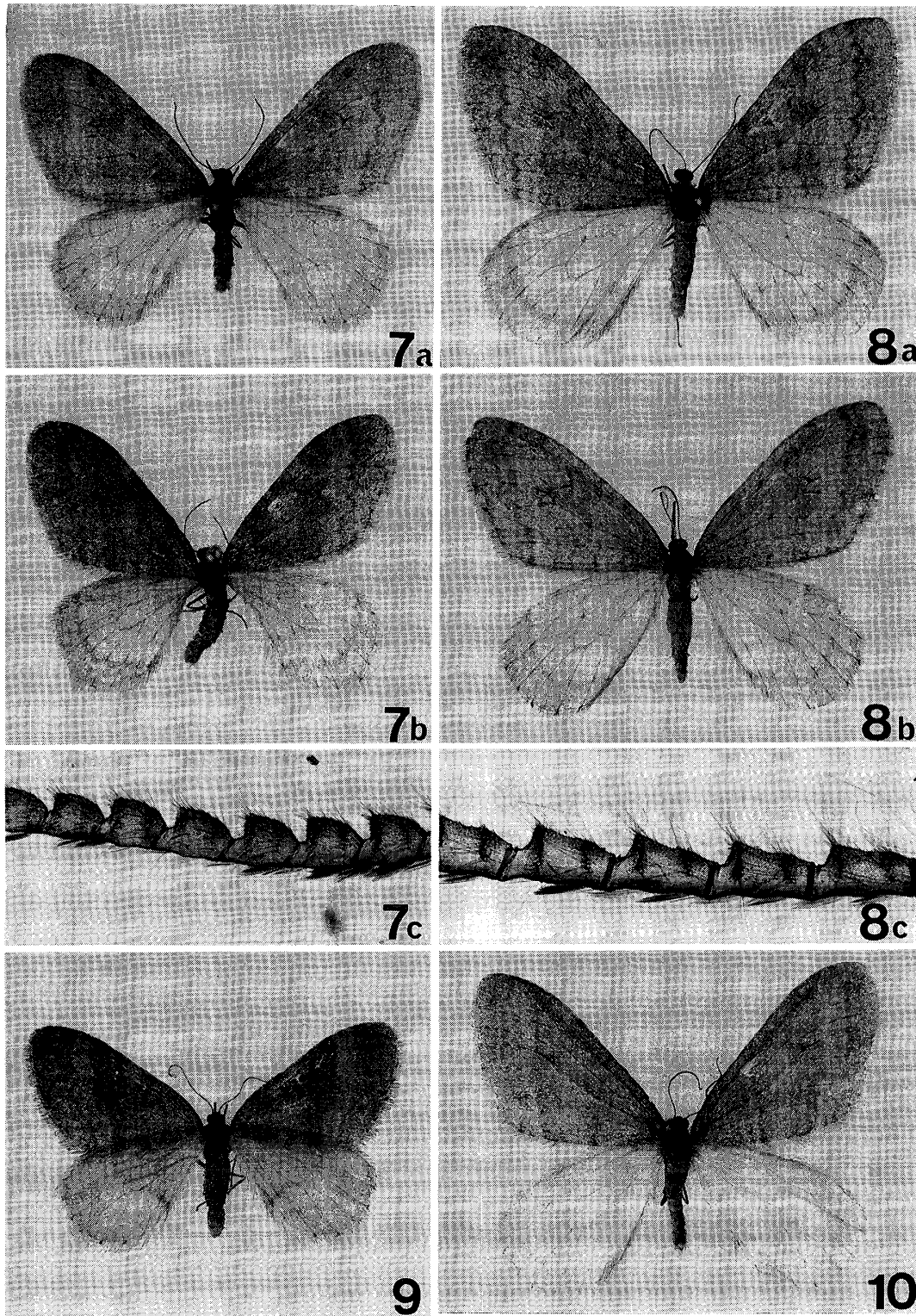
Male genitalia (Fig. 16). Similar to those of *brumata*. Valva narrower than in *brumata*. Cornuti of two slender sclerotized plates, much shorter than in *brumata* and *fagata*.

Female genitalia (Fig. 11). Signum absent, while two signa are present in *brumata* and one signum in *fagata*. Ductus bursae rather narrow, as long as in *brumata*.

Type series. Holotype, ♀, Copulating Pair (CP) No. 265, Tamako 150 m, Higashiyamato, Tokyo, 25. XII. 1990, H. NAKAJIMA leg., in NSMT. Paratypes. Data as holotype, 1 ♂ (CP No. 265, allotype); data as holotype, 6 ♂ 6 ♀(CP Nos. 259 – 264); type locality, 29. XII. 1990, 5 ♂ 5 ♀ (CP Nos. 267 – 271), 5. I. 1991, 1 ♂ 1 ♀(CP No. 301) (H. NAKAJIMA), 22. XII. 1990, 8 ♂ 8 ♀ (CP KY Nos. 190, 191, 198 – 203) (K. YAZAKI); Sakurakabu 210 m, Oshima Is. Tokyo, 29. XII. 1986, 1 ♂ 1 ♀(CP No. 133) (H. NAKAJIMA); Chuzenjiko 1,280 m, Nikko, Tochigi Pref., 15. XI. 1986, 1 ♂ 1 ♀ (CP No. 126) (H. NAKAJIMA); Irohazaka 800 m, Nikko, Tochigi Pref. 15. XI. 1986, 1 ♂ 1 ♀ (CP Nos. 120, 126) (H. NAKAJIMA); Harunako 900 m, Shibukawa, Gunma Pref., 21. XI. 1985, 6 ♂ 6 ♀ (CP Nos. 87, 90, 91, 93, 94, 96) (H. NAKAJIMA); Aokigahara 1,000 m, Ashiwada, Yamanashi Pref., 2. XII. 1990, 6 ♂ 6 ♀(CP Nos. 234, 235, 237, 242, 245) (H. NAKAJIMA);

Shuzenji 200 m, Izu, Shizuoka Pref., 5. I. 1991, 5 ♂ 5 ♀(CP) (H. KOBAYASHI), 19. I. 1991, 1 ♂ 1 ♀(CP No. 306) (H. NAKAJIMA).

Other material — Hokkaido: Futatsuyama 100 m, Shibecha, 10. X. 1958, 2 ♂, 28. X. 1981, 4 ♂, 11. XI. 1983, 3 ♂, 3. XI. 1985, 1 ♂ (K. IIJIMA); Arashiyama, Asahikawa, 3. XI. 1985, 2 ♂ (Y. KUSUNOKI); Kagurayama, Asahikawa, 20. X. 1984, 2 ♂, 27. X. 1985, 1 ♂, 28. X. 1985, 1 ♂, 9. XI. 1985, 2 ♂ (Y. KUSUNOKI); Sounkyo 600 m, Kamikawa, 11. XI. 1983, 2 ♂ (Y. WATANABE); Yachigashira, Hakodate, 29. XI. 1990, 1 ♂ (M. KAMEDA). Yamagata Pref.: Zao-line, Kaminoyama, 16. XI. 1987, 2 ♂(S. KIMATA); Hijiori-onsen 400 m, Okura, 22. XI. 1987, 28 ♂ (H. NAKAJIMA); Mokuzozan 1,200 m, Shinjo, 23. XI. 1987, 6 ♂ (H. NAKAJIMA). Ibaraki Pref.: Tsukubasan, 1. I. 1976, 1 ♂ (K. KUDO). Tochigi Pref.: Chuzenjiko, 22. XI. 1984, 2 ♂ 1 ♀, 15. XI. 1986, 2 ♂, 21. XI. 1988, 2 ♂, 17. XI. 1990, 5 ♂ (H. NAKAJIMA); Akechidaira 1,000 m, Nikko, 22. XI. 1988, 1 ♂ (H. NAKAJIMA); Irohazaka, 15. XI. 1986, 5 ♂, 2. XI. 1988, 1 ♂, 22. XI. 1988, 1 ♂ (H. NAKAJIMA). Gunma Pref.: Doai 800 m, Minakami, 3. XI. 1986, 4 ♂ (H. NAKAJIMA), 17. XI. 1985, 1 ♂ (N. IIZUKA); Tokura 1,000 m, Katashina, 17. XI. 1985, 3 ♂ (H. NAKAJIMA); Harunako, 21. XI. 1985, 49 ♂ 7 ♀ (H. NAKAJIMA). Tokyo: Takaosan 480 m, Hachioji, 10. XII. 1986, 19 ♂, 16. XII. 1986, 4 ♂, 20. XII. 1986, 3 ♂, 8. XII. 1987, 2 ♂, 8. XII. 1988, 3 ♂, 13. XII. 1988, 10 ♂, 3. XII. 1990, 1 ♂, 29. XII. 1990, 3 ♂ (H. NAKAJIMA), 21. XII. 1957, 1 ♂ (K. ISHIZUKA); Sakurakabu, 29. XII. 1986, 10 ♂ (H. NAKAJIMA); Tamako, 20. XII. 1990, 1 ♂, 25. XII. 1990, 33 ♂, 27. XII. 1990, 4 ♂, 29. XII. 1990, 11 ♂ 2 ♀ (H. NAKAJIMA). Kanagawa Pref.: Jinmuji 100 m, Zushi, 8. I. 1987, 6 ♂ (T. IKENOUE); Onuma 90 m, Sagamihara, 19. XII. 1989, 1♂ (H. NAKAJIMA); Nakatsukeikoku 300 m, Kiyokawa, 23. XII. 1981, 1 ♂ (H. NAKAJIMA); Hokizawa 780 m, Matsuda, 25. XI. 1988, 1 ♂, 6. XII. 1988, 2 ♂, 10. XII. 1988, 2 ♂ (H. NAKAJIMA); Inukoejirindou 800 m, Matsuda, 7. XII. 1989, 4 ♂, 12. XII. 1989, 8 ♂ (H. NAKAJIMA); Kamiyama 1,200 m, Hakone, 30. XI. 1985, 7 ♂ 1 ♀ (H. NAKAJIMA); Kamiyuonsen 900 m, Hakone, 5. XII. 1987, 1 ♂, 3. XII. 1988, 6♂ (H. NAKAJIMA); Takanosuyama, 700 m, Hakone, 13. XII. 1985, 3♂, 6. XII. 1986, 1♂, 20. XII. 1986, 5♂ (H. NAKAJIMA). Niigata Pref.: Sasagamine 1,300 m, Myokokogen, 9–10. XI. 1984, 3 ♂ (H. NAKAJIMA); Sanbongi 1,320 m, Myokokogen, 10. XI. 1984, 1 ♂ (N. IIZUKA); Shibutamibashi 1300 m, Myokokogen, 2. XI. 1987, 1 ♂ (H. NAKAJIMA); Akakura 800 m, Myokokogen, 9. XI. 1984, 1 ♂ (H. NAKAJIMA). Yamanashi Pref.: Anayama, Sudama, 13. XI. 1984, 1♂ (S. MUNESUE); Mitsutoge 1,200 m, Kawaguchiko, 2. XII. 1990, 2 ♂, 6. XII. 1990, 1 ♂ (H. NAKAJIMA); Aokigahara 1,000 m, 2. XII. 1990, 2 ♂ (H. NAKAJIMA). Nagano Pref.: Bandokoro 1,300 m, Norikurakogen, 1. XI. 1986, 7 ♂ (H. NAKAJIMA); Nagawado 1,100 m, Nagawa, 5. XI. 1989, 2 ♂ (H. NAKAJIMA). Shizuoka Pref.: Shuzenji 200 m, Izu, 5. I. 1991, 4 ♂, 12. I. 1991, 1 ♂ (H. KOBAYASHI). Gifu Pref.: Yorokoen, 15. XII. 1972, 1 ♂ (H. ENDO); Shiratani, Tokuyama, 3. XII. 1977, 1 ♂ (H. KASAI). Osaka Pref.: Mino, 11. XII. 1988, 1 ♂ (N. IIZUKA). Oita Pref.: Daisen 1,200 m, Kuju, 22. XI. 1986, 1 ♂ (H. NAKAJIMA).

Note. This species is very common in Kyushu, Honshu and Hokkaido. In the Kanto District, the moth inhabits from low hills (150 m) to mountains (1,300 m), but seems to prefer low hills.

Figs. 3 – 6. *Operophtera* spp., female. 3. *O. brunnea* sp. n. ; a. Holotype. b. Paratype. 4. *O. vulgaris* sp. n. ; a. Holotype. b. Paratype. 5. *O. brumata* (LINNAEUS), Denmark. 6. *O. fagata* (SCHARFENBERG), Denmark.

Figs. 7–10. *Operophtera* spp., male. 7. *O. brunnea* sp. n. ; a. Allotype. b. Paratype. c. Antenna. 8. *O. vulgaris* sp. n. ; a. Allotype. b. Paratype. c. Antenna. 9. *O. brumata* (LINNAEUS), Denmark. 10. *O. fagata* (SCHARFENBERG), Denmark.

Operophtera vulgaris sp. n.
(Figs. 2, 4, 8)

Operophtera brumata (part.): INOUE, 1957: 218, pl.41, figs. 1135 (♂), 1136 (♀); INOUE, 1959: 194, pl.137, fig. 15a (♂); INOUE, 1982, **1**: 490, **2**: pl. 74, figs. 24, 25a (♂), 26 (♀); NAKAJIMA, 1987: 63, pl. 25, figs. 12–13 (mature larvae), 14 (♂), 15 (copulating pair); NAKAJIMA, 1990: 124, fig. 1 (♂).

Male (Fig. 8). Each segment of antenna long in distal half. Forewing length 16–22 mm. Similar to large specimens of *brunnea*. Wing length rather variable, generally longer than in *brumata* and *fagata*. Forewing grayish white or grayish brown, not so tinged with dark brown as in *brunnea*. In forewing, transverse lines irregularly waved, space between post medial and subterminal lines paler in most specimens, but in a few specimens this space is represented by a dark brown belt as seen in *brunnea*.

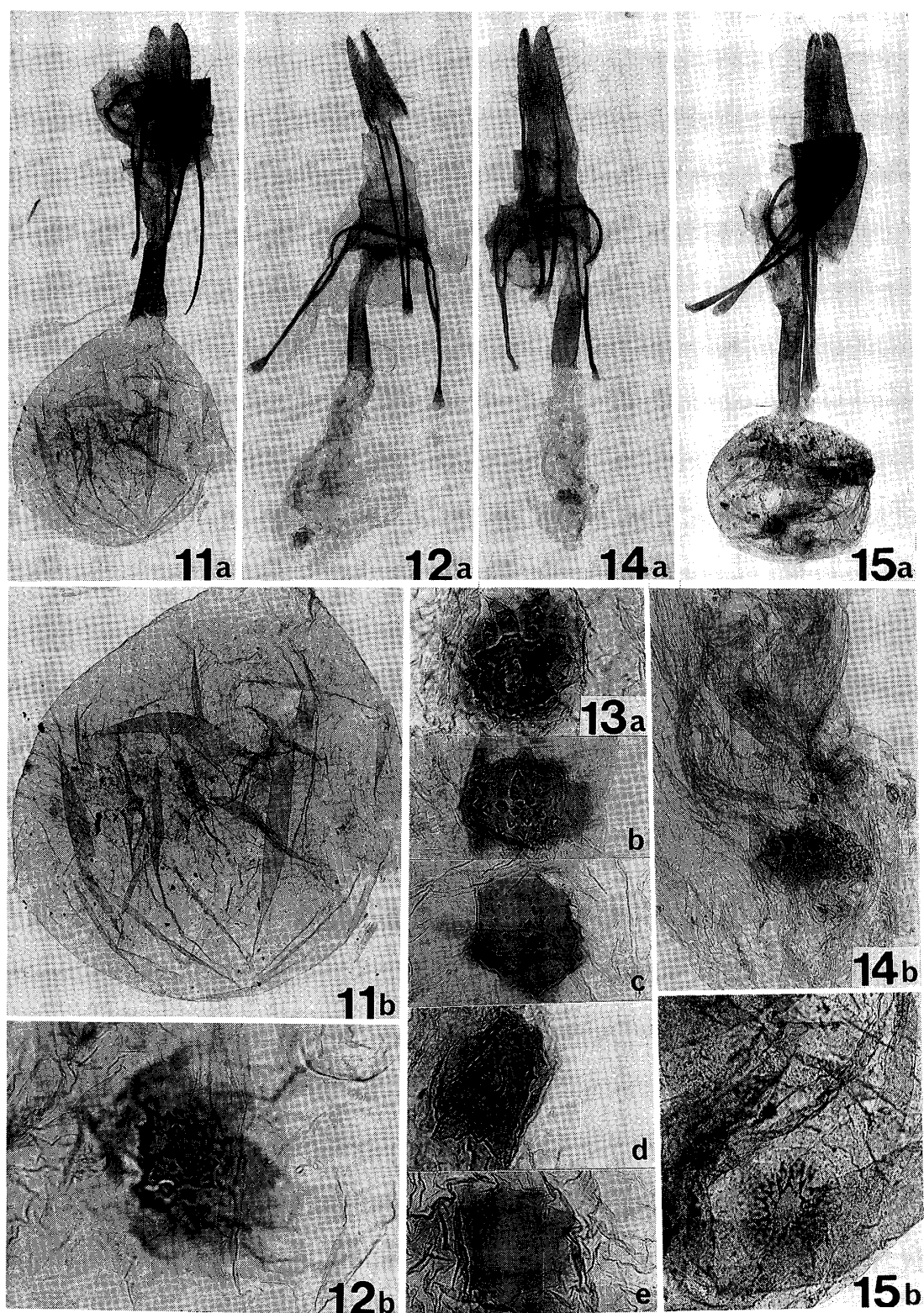
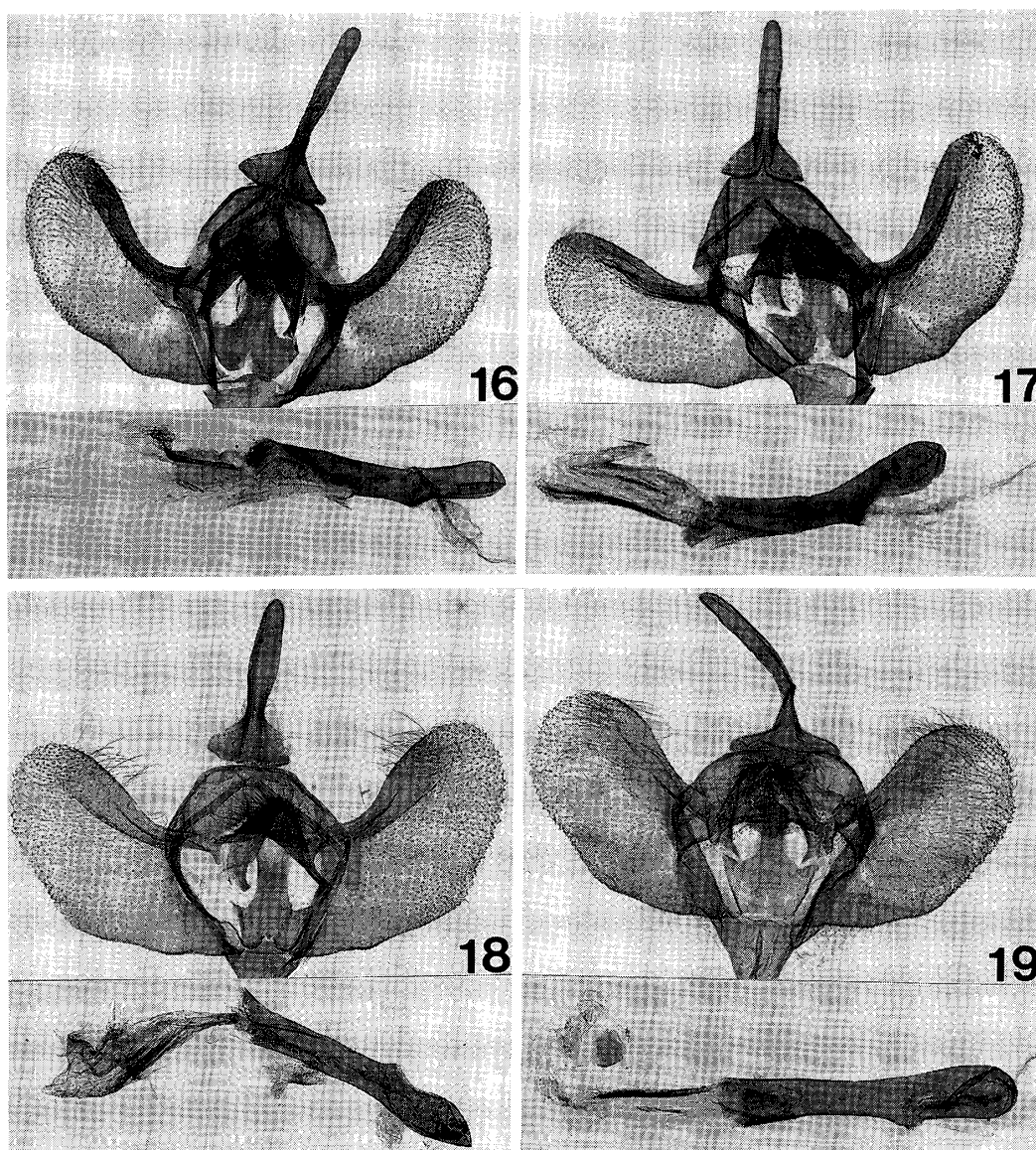
Female (Fig. 4). Forewing length 3–5 mm. Similar to *brunnea*. Body brown, paler than in *brunnea*, forewing slightly narrower and longer than in *brunnea*.

Male genitalia (Fig. 17). Valva similar to that of *brunnea*, narrower than in *brumata* and *fagata*. Two cornuti much longer than those of *brunnea*.

Female genitalia (Figs. 12, 13). Ductus bursae wide and short in most specimens. Corpus bursae with one signum scattered with fine spines, shape of signum variable, represented by a smooth plate in some specimens.

Type series. Holotype, ♀, Copulating Pair No. 206, Yumoto 1,500 m, Nikko, Tochigi Pref., 17. XI. 1990, H. NAKAJIMA leg., in NSMT. Paratypes. Data as holotype, 1 ♂ (CP No. 206, allotype) (H. NAKAJIMA); Tarayama 1,400 m, Nikko, Tochigi Pref., 2. XI. 1990, 1 ♂ 1 ♀ (CP No. 200) (H. NAKAJIMA); Akanuma 1,380 m, Nikko, Tochigi Pref., 15. XI. 1986, 3 ♂ 3 ♀ (CP Nos. 88, 128, 130) (H. NAKAJIMA); Chuzenjiko 1,280 m, Nikko, Tochigi Pref. 22. XI. 1984, 1 ♂ 1 ♀ (CP No. 58), 15. XI. 1986, 4 ♂ 4 ♀ (CP Nos. 123–125, 127) (H. NAKAJIMA); Irohazaka 800 m, Nikko, Tochigi Pref., 15. XI. 1986, 2 ♂ 2 ♀ (CP Nos. 119, 121) (H. NAKAJIMA); Harunako 900 m, Shibukawa, Gunma Pref., 21. XI. 1986, 2 ♂ 2 ♀ (CP Nos. 85, 86) (H. NAKAJIMA); Doai 800 m, Minakami, Gunma Pref., 17. XI. 1985, 1 ♂ 1 ♀ (CP), 15. XI. 1986, 2 ♂ 2 ♀ (CP) (N. IIZUKA); Takaosan 480 m, Hachioji, Tokyo, 12. XII. 1988, 1 ♂ 1 ♀ (CP)(H. NAKAJIMA); Futatsuzukatoge 640 m, Ome, Tokyo, 25. XII. 1989, 1 ♂ 1 ♀ (CP No. 149) (H. NAKAJIMA); Hokizawa 780 m, Matsuda, Kanagawa Pref., 5. XII. 1990, 1♂1♀ (CP No. 253) (H. NAKAJIMA); Aokigahara 1,000 m, Ashiwada, Yamanashi Pref., 2. XII. 1990, 11 ♂ 11 ♀ (CP Nos. 231–233, 236, 238–241, 243, 244, 256) (H. NAKAJIMA), 6 ♂ 6 ♀ (CP KY Nos. 174–176, 178, 179, 182) (K. YAZAKI); Shuzenji 200 m, Izu, Shizuoka Pref., 5. I. 1991, 2 ♂ 2 ♀ (CP) (H. KOBAYASHI).

Other material — Hokkaido: Oshidomari, Rishiri Is., Kitami, 25. X. 1967, 5 ♂, 26. X. 1967, 15 ♂, 27. X. 1967, 11 ♂ (I. TATEYAMA); Arashiyama, Asahikawa, 3. XI. 1985, 1♂ (Y. KUSUNOKI); Sounkyo, Kamikawa, 11. XI. 1983, 2♂ (Y. WATANABE) ; Futatsuyama 100 m, Shibecha, 6. XI. 1952, 1 ♂, 6. XI. 1956, 1 ♂, 2. XI. 1981, 4 ♂(K. IIJIMA). Yamagata Pref.: Zao-line, Kaminoyama, 16. XI. 1987, 7 ♂ (S. KIMATA); Hijiorionsen, Okura, 22. XI. 1987, 14 ♂ (H. NAKAJIMA). Tochigi Pref.: Yumoto, 21. XI. 1974, 1 ♂, 12.

XI. 1983, 3 ♂, 5. XI. 1984, 8 ♂, 15. XI. 1984, 3 ♂, 22. XI. 1985, 3 ♂ (H. NAKAJIMA); Akanuma, 12. XI. 1983, 10 ♂, 21 – 22, XI. 1984, 9 ♂, 22. XI. 1988, 2 ♂ (H. NAKAJIMA); Shobugahama 1,320 m, Nikko, 2. XII. 1983, 1 ♂ (H. NAKAJIMA); Chuzenjiko, 15. XI. 1986, 9 ♂, 21. XI. 1988, 5 ♂, 17. XI. 1990, 2 ♂ (H. NAKAJIMA); Akechidaira, 1,000 m, Nikko, 22. XI. 1988, 3 ♂ (H. NAKAJIMA); Irohazaka, 15. XI. 1986, 8 ♂, 22. XI. 1988, 3 ♂ (H. NAKAJIMA). Gunma Pref.: Doai, 16. XI. 1984, 1 ♂ (N. IIZUKA), 3. XI. 1986, 7 ♂ (H. NAKAJIMA); Tanigawaonsen 900 m, Minakami, 16. XI. 1974, 2 ♂ (H. NAKAJIMA); Takaragawa, Minakami, 30. X. 1978, 1 ♂ (H. NAKAJIMA); Hatomachitoge 1,500 m, Katashina, 29. X. 1987, 1 ♂ (H. NAKAJIMA); Tokura, 1,100 m, Katashina, 17. XI. 1985, 19 ♂ (H. NAKAJIMA); Harunako, 21. XI. 1985, 40 ♂ (H. NAKAJIMA) ; Mikaboyama 750 m, 17. XI. 1969, 1 ♂, 27. XI. 1990, 1 ♂ (Y. SAITO). Tokyo: Takaosan, 30. XII. 1962, 1 ♂ (K. JINBO), 2. I. 1972, 1 ♂, 5. I. 1972, 1 ♂ (R. TOKUNAGA), 29. XI. 1986, 1 ♂, 6. XII. 1986, 6 ♂, 10. XII. 1986, 3 ♂, 16. XII. 1986, 35 ♂, 20. XII. 1986, 11 ♂, 8. XII. 1987, 3 ♂, 8. XII. 1988, 6 ♂, 13. XII. 1988, 3 ♂, 4. XII. 1989, 1 ♂ (H. NAKAJIMA); Kotokuji, Itsukaichi, 28. XII. 1984, 2 ♂ (H. NAKAJIMA); Futatsuzuka-toge, 25. XII. 1989, 13 ♂ (H. NAKAJIMA). Kanagawa Pref.: Inukoejirindo 800 m, Matsuda, 6. XII. 1988, 8 ♂, 10. XII. 1988, 4 ♂ (H. NAKAJIMA); Hokizawa, 2. XII. 1989, 1 ♂, 7. XII. 1989, 7 ♂, 12. XII. 1989, 9 ♂, 8. XII. 1990, 2 ♂ (H. NAKAJIMA), 10. XII. 1989, 1 ♂ (T. IKENOUE); Karasawa 500 m, Kiyokawa, 8. XII. 1981, 9 ♂ (H. NAKAJIMA); Nakatsukeikoku 300 m, Kiyokawa, 23. XII. 1981, 9 ♂ (H. NAKAJIMA) Odarumi 400 m, Tsukui, 8. XII. 1981, 1 ♂ (H. NAKAJIMA); Kamiyama 1,200 m, Hakone, 30. XI. 1985, 11 ♂ (H. NAKAJIMA); Kamiyuonsen 900 m, Hakone, 5. XII. 1987, 4 ♂, 3. XII. 1988, 3 ♂ (H. NAKAJIMA); Nakagora 700 m, Hakone, 20. XII. 1986, 3 ♂ (H. NAKAJIMA); Takanosuyama 700 m, Hakone, 13. XII. 1985, 10 ♂, 6. XII. 1986, 1 ♂, 20, XII. 1986, 6 ♂, 13. XII. 1988, 1 ♂ (H. NAKAJIMA); Shonandaira 200 m, Oiso, 24. XII. 1987, 1 ♀, 24. XII. 1988, 1 ♂ (T. IKENOUE), 18. I. 1987, 1 ♂ (N. IIZUKA), 9. I. 1991, 6 ♂ 6 ♀ (CP) (Y. YANAGIDA). Niigata Pref.: Sasagamine 1,300 m, Myokokogen, 9 – 10. XI. 1984, 3 ♂ (H. NAKAJIMA); Kaname 1,500 m, Myokokogen, 2. XI. 1986, 1 ♂ (H. NAKAJIMA); Shibutamibashi 1,300 m, Myokokogen, 2. XI. 1986, 4 ♂, 2. XI. 1987, 5 ♂ (H. NAKAJIMA); Akakura 800 m, Myokokogen, 3. XI. 1962, 1 ♂ (K. JINBO), 9. XI. 1984, 8 ♂ (H. NAKAJIMA); Tsuchitaru, Yuzawa, 21. XI. 1982, 2 ♂, 17. XI. 1984, 1 ♂, (N. IIZUKA), 20. XI. 1983, 1 ♂, 18. XI. 1984, 1 ♂ (T. IKENOUE). Yamanashi Pref.: Yanagisawatoge 1,420 m, Enzan, 14. XI. 1990, 3 ♂ (H. NAKAJIMA); Sanjo 1,100 m, Ushiroyama-rindo, 28. XI. 1976, 4 ♂ (K. YAZAKI); Koganesawa-rindo 700 m, 25. XI. 1978, 3 ♂ (K. YAZAKI); Fukashiro 600 m, 28. XI. 1976. 9 ♂ (K. YAZAKI); Wakamiko, Sudama, 23. XII. 1981, 15 ♂, 23. XII. 1989, 2 ♂ (H. NAKAJIMA); Hosaka 600 m, Nirasaki, 8. XII. 1989, 1 ♂ (H. NAKAJIMA); Mitsutoge 900 m, Kawaguchiko, 6. XII. 1990, 2♂ (H. NAKAJIMA); Aokigahara, 2. XII. 1990, 5 ♂ (H. NAKAJIMA). Nagano Pref.: Kamikochi 1,500 m, Azumi, 4. XI. 1989, 3 ♂ (H. NAKAJIMA); Nagawado 1,000 m, Nagawa, 1. XI. 1986, 1 ♂ (H. NAKAJIMA); Okushasando 1,200 m, Togakushi, 23. XI. 1990. 6 ♂ (H. NAKAJIMA); Jizotoge 1,600 m, Komoro, 4. XI. 1985, 5 ♂ (H. NAKAJIMA); Takaminekogen 900 m, Komoro, 4. XI. 1985, 1 ♂ (H. NAKAJIMA); Kiyosato 1,300 m, Takane, 17. XI. 1971, 2 ♂, 21. XI. 1971, 2 ♂, 12. XI. 1972, 4 ♂ (H. INOUE); Kaneuchidaira 1,800 m, Nyugasayama, 8. XI. 1990, 1 ♂ (H. NAKAJIMA); Sawairi 1,400 m, Nyugasayama, 8. XI. 1990, 1 ♂ (H. NAKAJIMA); Aokiko

Figs. 11 – 15. Female genitalia of *Operophtera* spp. 11a, b. *O. brunnea* sp. n., holotype (HN Slide 2571). 12a, b. *O. vulgaris* sp. n., holotype (HN Slide 2561). 13a – e. Signa of *O. vulgaris* sp. n. 14a, b. *O. brumata* (HN Slide 2436). 15a, b. *O. fagata* (HN Slide 2568).

Figs. 16 – 19. Male genitalia of *Operophtera* spp. 16. *O. brunnea* sp. n., allotype (HN Slide 2572). 17. *O. vulgaris* sp. n., allotype (HN Slide 2558). 18. *O. brumata* (HN Slide 2430). 19. *O. fagata* (HN Slide 2432).

820m, 5. XI. 1974, 1 ♂ (M. Tomonaga). Shizuoka Pref.: Koyama, Gotenba, 14. XII. 1981, 1 ♂, 6. XII. 1983, 1 ♂ (H. Nakajima). Gifu Pref.: Yorokoen, 15. XII. 1972, 2 ♂ (H. Endo); Shiratani, Tokuyama, 3. XII. 1977, 1 ♂ (H. Kasai).

Note. This new species is distributed from the Kansai District of Honshu to Hokkaido, almost sympatric with *brunnea*. At Tamako (150 m) near Tokyo this species was not found though *brunnea* is very common, and both species inhabit at the top of Mt. Takao (480 m), 20km west of Tamako. At Nikko area in the northern part of the Kanto District, both species are found sympatrically in rather lower parts (Irohazaka 900 m, Akechidaira 1,000 m and Chuzenjiko 1,280 m), and only this new species is collected at Akanuma 1,380 m and Yumoto 1,500 m.

This species is very similar to *O. brunnea* and rather difficult to separate them in the external characters. Generally the medial line of male forewing acutely angulate inwards near costa, while in *brunnea* it runs smoothly. European specimens of *O. fagata* are also similar to this species, but the male forewing is pale yellowish white and the median space between medial and postmedial lines is never tinged with dark.

PELLMYR (1980) described the genitalia of *brumata* and *fagata* from Europe, and noted the variations of them. In the female genitalia the number of short spines in the signa of the two species are considerably variable, but the signa are not represented by a smooth plate found in some *vulgaris*.

In the eastern part of USSR there is a related species, *Operophtera peninsularis* DJAKONOV, 1931, which is distributed in Kamchatka and has simple antennae in male while the male antenna is slightly dentate in the other species.

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摘　　要

日本産 *Operophtera* 属（鱗翅目，シャクガ科）の2新種の記載　（中島秀雄）

Operophtera は日本に6種分布している．そのうち，*Operophtera brumata* (LINNAEUS) は旧北区に広く分布しており，日本でも全国的に広く産することが知られていた．そして，その近縁種の *O. fagata* (SCHARFENBERG) はヨーロッパに分布し，*brumata* に比べて♂の前翅長が大きく，黄白色で光沢があり，♀においても前翅長が大きいことで明確に識別されていた．

私は，日本の各地の多数の個体を採集して調べて行くうちに，日本のものにも♀の前翅に大小の差があることに気づき，*fagata* の分布の可能性を考慮して再検討した．しかし，ヨーロッパの2種の雌雄を入手して比較したところ日本のものは外観および交尾器に *brumata*, *fagata* とは明瞭な差異が認められ，別種と判断できた．さらに，日本に生息しているものを交尾ペアを重点的に比較した結果，2種含まれている結論に達したので，これらを新種として記載した．

Operophtera brunnea NAKAJIMA, sp. n. コナミフユナミシャク（新称）

♂の前翅長は 14 - 17 mm．外観は *brumata* に似る．触角の中央部から先端の各節は短い．前翅は灰褐色から暗褐色で中横線，外横線，亜外縁線は波状に走る．翅の色は変化に富むが，*brumata* のように赤みを帯

びることはない．♀の前翅長は1－3 mm．体は暗褐色で前翅は非常に小さい．♂交尾器は *brumata* に似るが，valva の幅は狭い．Cornuti は長短2本の針状の突起からなり，*brumata*, *fagata*, もう一種の新種の *vulgaris* に比べて短い．♀の交尾器では signum を欠く．一方 *brumata* は2個，*fagata* では1個生じる．

北海道，本州，九州に分布し，各地で採集されている．関東地方でみると，低山地に多いが，中禅寺湖（1,300 m）などがかなり高標高の地域まで産する．

Operophtera vulgaris NAKAJIMA, sp. n. オオナミフユナミシャク（新称）

♂の前翅長は16－22 mm．触角は中央部から先端の各節で長く，前種との良い区別点となる．前翅長は変化に富むが一般に *brumata*, *fagata*, *brunnea* に比べて大きい．前翅の色も変異があるが，灰白色から灰褐色である．*Brunnea* とは個体変異を含めてみると，外観で区別することは困難であるが，本種では中横線が前縁の近くで外側にくの字状に切れ込み，真っすぐ前縁に向かう *brunnea* との区別の目安になる．♀の前翅長は3－5 mm．*Brunnea* に比べて前翅が大きい．*Fagata* に似るが前翅がやや幅狭い．♂交尾器の valva は *brumata*, *fagata* に比べて幅狭い．*Brunnea* に非常によく似ており，valva の形状で区別するのは困難である．Cornuti は *brunnea* に比べて長いのでこの点で区別できる．♀交尾器の signum は1個生じる．その形状は小さい突起が多数集合するが，その数には変化があり，突起がほとんど無く板状になるものもある．

本種は北海道，本州に広く分布し，前種との混生地も多い．そして，垂直分布は関東地方でみると500 m位の低山から1,500 mの亜高山帯まで産する．多摩湖(150 m)では本種は生息しない．高尾山山頂付近(480 m）では *brunnea*, *vulgaris* ともいる．

（Accepted May 30, 1991）

Published by the Lepidopterological Society of Japan, c/o Ogata Hospital, 2-17, Imabashi 3-chome, Chuo-ku, Osaka, 541 Japan